

*22  
Amend.*

said demodulator (50) being electronic and having a varying design depending upon modulation type of the signal.

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REMARKS:

The claims in the application are 21-49.

Favorable reconsideration of the application as amended is respectfully requested.

Another copy of Form PTO-1449 accompanying the first timely filed Information Disclosure Statement is enclosed herewith. It is respectfully requested that the art listed upon the accompanying Form PTO-1449 be timely made of record in the present application. Additionally, another copy of the Official filing Receipt is enclosed upon which the priority claim and small entity status have been noted. It is respectfully requested that a corrected Official Filing Receipt be issued in the present application.

The drawing correction requirement raised on accompanying Form PTO-948 has been noted. Appropriately-corrected drawings will be submitted after a Notice of Allowance is received in the present application. A new Abstract has been inserted in accordance with paragraph 2 of the Office Action.

Additionally, new Claims 21-49 introduced herein explicitly eliminate the formal rejections under 35 U.S.C. §112 (second paragraph), set forth in paragraphs 6 and 7 of the Office Action. In this regard, it is respectfully pointed out that alternative terminology such as "or" is entirely acceptable and definitive in claim recitation (M.P.E.P. §2173.05 (h)II). Claims 21-49 introduced herein find clear support throughout the present application. More particularly, Claims 21-24 respectively correspond with

Claims 1-4, with Claims 25-28 corresponding to recitation in Claims 5 and 6. Claims 29-35 respectively correspond to Claims 7-13, with Claims 36 and 37 corresponding to recitation found in Claim 14. Additionally, Claims 38-41 respectively correspond to Claims 15-18.

Support for Claims 42 and 43 can be found at the bottom of page 5 of the specification, with Claims 44 and 45 finding support at the top of page 10 of the specification and in Fig. 2, Claims 46 and 47 finding support in the middle of page 10 of the specification and in Fig. 3, and Claims 48 and 49 finding support at the bottom of page 10 of the specification to page 11 and in Fig. 4. Accordingly, it is respectfully submitted that the present set of claims herein quite clearly and definitively claims the invention in accordance with all pre-requisites of 35 U.S.C. §112.

Therefore, the only outstanding issue is the art rejection of the claims.

More particularly, Claims 1-11, 16 and 18-20 have been rejected under 35 U.S.C. §102(e) as anticipated by U.S. Pat. Nos 6,091,522 to Snawerdt, II. or 5,991,062 to Fischer et al. in paragraph 9 of the Office Action. Claims 12-15 and 17 have not been rejected over any art. Accordingly, these claims respectively correspond to Claims 34-36, 38 and 40 amended into independent form. Thus, it is respectfully submitted that, at the very least, these particular claims should now be in condition for allowance. Snawerdt, III et al. '522 were filed July 6, 1998 after the priority date of the present application. Accordingly, a Verified Statement with the accompanying English translation of the priority application No. 198 01 469.4, is enclosed, establishing that the priority application is an enabling disclosure of the invention claimed herein. Thus, Snawerdt, III et al. '522 have been eliminated as a reference.

In any event, the features of the presently claimed invention together with the accompanying advantages attained thereby, will be briefly described with reference to the preferred embodiments of the present invention illustrated in the drawings of the present application.

The present application explicitly provides for detecting or generating optical signals with high spectral resolution even when relatively small optical elements are used and wavelength of an optical carrier to be received or modulated being freely selectable without great technical effort for control of a local reference light source. These and other advantages are attained by the present invention as recited, e.g., in independent Claim 21 which is directed to a device for detecting optical signals comprising means 10, 11, 20, 80 for generating at least one reference light ray, means 20, 30 for aligning the optical signal to be detected and/or the reference light ray to bring them together in interference, and at least one detector 40 with a demodulator 50 being arranged to detect modulation.

In particular, at least one wavelength-dependent element 11, 12, 14 is structured and arranged to change angle(s) of the rays brought into interference depending upon the wavelength, and at least one of the detectors 40 is structured and arranged, either alone or in combination with the demodulator 50 and/or optical elements, to measure time and/or spatial modulation of intensity with reference to the entire or parts of the detector ray cross-section. As recited in independent Claim 22, instead of or together with the detector 40 and demodulator 50, at least one coupler is structured and arranged to couple out the resulting interference signal, with at least one coupler structured and arranged, alone or in combination with at least one of a

demodulator or optical elements, to make the coupled-out signal dependent upon time and/or spatial modulation of intensity with reference to the entire or parts of the detector ray cross-section.

The features of the presently claimed invention together with the accompanying advantages attained thereby, are not taught or suggest by Fischer et al, for the following reasons.

Fischer et al. describe a method and an accompanying device for use in adjusting a coherent optical receiver. This reference relates to generating error signals for control of the exact optical alignment of two light waves and spatial beam regulation. This reference is essentially directed to a conventional coherent optical receiver having a local oscillator used to receive a phase modulated signal (i.e., means for superimposing the received light wave with a locally-generated reference wave). Additionally, the following elements can be included in the system and method of Fischer et al:

- an additional beam splitter for sub-dividing the superimposed beam to be used by at least two detectors;

- use of special detectors each comprising at least two separate zones; and
- means for electronically generating spatial error signals by combining the signals from the detector zones to suitable difference and sum signals.

Contrary to Fischer et al, the presently claimed invention relates to a device for detecting optical signals depending upon their wavelength, even without using a local oscillator. Please see, e.g., Claims 42 and 43 introduced herein. The presently claimed invention relates to an innovative method and device for detecting the

optical signal itself, and is not used for generating error signals. In the present invention, a conventional coherent optical receiver (without need of a local oscillator) is used to receive phase modulated optical signals (i.e., means for superimposing an incoming light wave with a derived reference wave). The present invention comprises the following additional elements:

at least one wavelength-dependent element 11, 12, 14 by which the angle of the light beams brought into interference can be changed according to wavelength, and

at least one detector is designed either alone or in combination with the demodulator 50, such that time and/or spatial modulation of intensity with reference to the entire or parts of the beam cross-section detected, can be measured.

According to Fischer et al., generating error signals requires as an indispensable prerequisite, a local oscillator and specially designed detectors together with the accompanying electronics. In contrast, the presently claimed invention does not require a local oscillator. Furthermore, the use of a detector arrangement or the electronic processing described in Fischer et al. would especially be contrary to the working principle of the present invention.

The present invention is based upon using a wavelength-dependent element 11, 12, 14 by which the angle of the light beams brought into interference can be changed according to wavelength. In preferred embodiments, the wavelength-dependent element 11, 12, 14 is explicitly a diffractive grating or dispersing prism. The wavelength-dependent optical element is indispensable for functioning of the described

optical set-up. However, such a wavelength dispersive optical element is contradictory to the functioning principle of Fischer et al.

As pointed out supra, Snawerdt, III et al. '522 were filed July 6, 1998, after the priority date of the present application, and hence eliminated as a reference. Should the Examiner decide to cite and apply the parent application of Snawerdt, III et al. '522, namely U.S. Pat. No. 5,805,317, then it is respectfully pointed out that such application must be made in a nonfinal Office Action. In any event, Snawerdt, III et al. '522 simply relate to a method for processing or detecting radar signals using phase information. More particularly, this reference relates to analysis of a cross correlation of the received radar signal with a locally generated radio frequency signal using an optical fourier transform correlator to perform the cross correlation. Snawerdt, III et al. '522 are remote to the claimed invention.

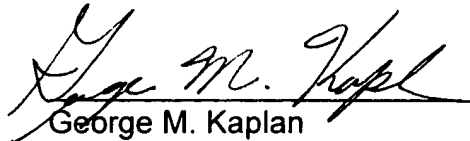
The remaining art of record has not been applied against the claims and will not be commented further at the present time.

Accordingly, in view of the foregoing amendment and accompanying remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any questions, then it is respectfully requested that the undersigned attorney be contacted at the earliest convenience to discuss the

present application. A petition for an automatic three month extension of time for response under 37 C.F.R. § 1.136(a) is enclosed in triplicate, together with the requisite petition fee and the fee for the additional claims introduced herein.

Early favorable action is earnestly solicited.

Respectfully submitted,

  
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